P1.35 THE OBSERVING SYSTEM MONITORING CENTER: A TOOL FOR THE EVALUATION OF THE GLOBAL OCEAN OBSERVING SYSTEM

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1. INTRODUCTION

In order to properly understand climate variability, the development, evaluation and maintenance of a sustained global observing system is required. As the Intergovernmental Panel on Climate Change (IPCC 2001) states, "Concern has been expressed about the present condition of the observational networks." Kevin Trenberth adds, "To advance the understanding of climate change and its forcings, it will be necessary to have a comprehensive global observing system reliably producing high-quality data and products." (Trenberth 2002). The Observing System Monitoring Center (OSMC) is being constructed in order to assess the current global ocean observing system as well as to aid in the development of new observing system components. Currently, the observing system for climatic data consists of a variety of sensors measuring a variety of physical variables from a variety of platforms. In order for the observing system to be effective, software and data systems are needed to keep track of the performance of the different sensors, in near-real time. The near-real time data access is critical to promptly overcome any shortcomings of the observing system. The goal of the OSMC is to fill the clear need for near-real time overseeing of the global ocean climate observing system. The OSMC will be an information gathering, decision support and display system and will also display current historical status of globally distributed data collection systems. In addition, the OSMC will provide the data visualization tools necessary to identify the coverage of any given collection of platforms and parameters.

2. FEATURES OF THE OSMC

The OSMC shows the types, location and timing of observations throughout the global oceans. The data is based on the in situ observations from the National Centers for Environmental Prediction (NCEP) and the U.S. Global Ocean Data Assimilation Experiment (GODAE) server, which receive their data from the Global Telecommunications System (GTS). The OSMC currently uses GODAE data for sub-surface observations and NCEP for surface observations. The data values are quality controlled in that they are compared to normal geophysical constraints and, if valid, are binned into one-degree latitude and longitude bins. All data falling into a particular bin are counted to create a final tally of daily observations in that bin. The data are available beginning in September, 1991 and are currently being updated on a monthly basis. The OSMC executive interface has four different components: Observational density, in situ sea surface temperatures (SST) observations, in situ SST and salinity profile observations, and observational density animations..

2.1 OBSERVATIONAL DENSITY

The observational density page allows the user to select several different variables: SST, sea level pressure (SLP), air temperature, dew point, wind speed/direction and cloud cover. The observational density of these variables is available from several sources, including ships, drifting buoys and fixed or moored buoys. The user may choose to see observation density as a function of the combined sources, or from each individual source. A threshold of minimum number of observations in a 5x5 degree box is also applied, and the preset values of the threshold range are 1, 5, 10, 15 or 25 observations. The user is able to select either a running time series, from September 1991 to the present, or a global view of a given year. Figure 1 illustrates a sample of each.

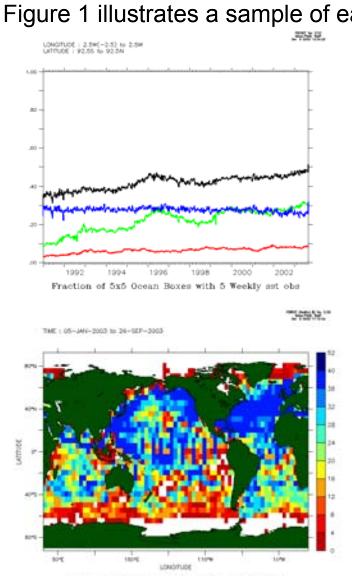

Figure 1 – Time Series and Global View plots from the OSMC Observational Density Page.

2.2 IN SITU SST OBSERVATIONS

For sea surface temperature (SST), the OSMC allows the user to view monthly observations of a given year from the desired platform. Available platforms include, ship, drifting buoy and moored or fixed buoys. The user can view observations associated with each individual platorm, all platforms combined, or all buoy platforms. The resulting plot shows the location of SST observations taken during the given month, and also the value of that SST observation. Figure 2 illustrates a sample plot.

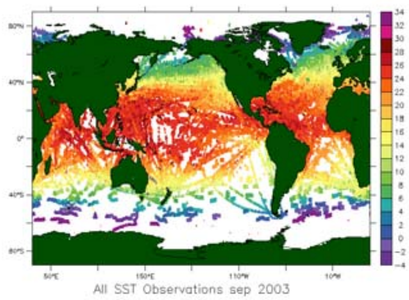

Figure 2 – SST observation plot of Sept. 2003 from the OSMC

2.3 IN SITU PROFILE OBSERVATIONS

Also available on the OSMC are sub surface observations taken from the US GODAE data. Temperature and salinity data are available as monthly products beginning in September 1991. When a user requests a given month and variable, the depths of the sub surface observations for the chosen variable are displayed. Figure 3 illustrates a sample plot.

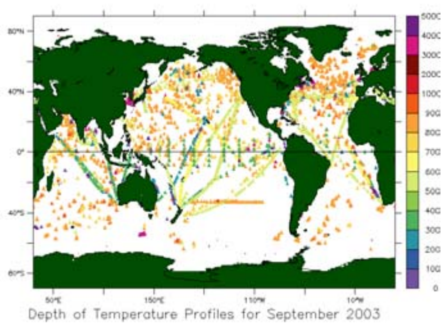

Figure 3 – Sub surface observation plot for Sept. 2003 from the OSMC.

2.4 OBSERVATIONAL DENSITY ANIMATIONS

Finally, the executive interface page of the OSMC contains a selection of observational density animations for SST, SLP and wind speed and direction. These animations were created using three different minimum number of observation thresholds. The thresholds used are 5, 10 and 25 monthly observations in a 5x5 degree box.

3. FUTURE DEVELOPMENT

An important, and key future aspect of the OSMC is the development of the OSMC Live Access Server (LAS). The OSMC LAS will allow “live” access to global observational data. A prototype of the LAS is available and provides access to the NCEP 5- degree by 5-degree observational density data. The operational LAS will provide more detailed control over visualizing and evaluating the global observing system. Both the LAS and the executive user interface will continue to be developed as components of the Observing System Monitoring Center. In addition, more detailed databases will be developed to contain complete metadata for all of the in situ observations, rather than simply the gridded summaries. This addition will make it possible to track the performance of individual instruments. This near-real time access to the data is what will make it possible to quickly rectify any shortcomings or problems with the global observing system.

4. CONCLUSION

According to Kevin Trenberth, “there is a need to set observations in the appropriate framework in order to obtain value from the data [collected]. A climate observing system must go beyond the climate observations themselves to include the processing and support system that leads to reliable and useful products.” (Trenberth, 2002). The function of the OSMC will be as an oversight facility which will be able to, with near-real time data, identify problems and shortcomings in the global observing system. This will be an important role in what the IPCC indicates is required to better understand climate change, namely “global data that clearly document the state of the system and how that state is changing as well as observations to illuminate important processes more clearly” (IPCC 2001).

5. AKNOWLEDGEMENTS

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6. REFERENCES

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